

CLAIMS

1. A process for preparing a fluorine-containing polymer,
which is a batch copolymerization process conducted under conditions
5 of reduced temperature of at least 0.95 and reduced pressure of at least
0.80 of the critical constant calculated from critical temperature, critical
pressure and composition ratio of each monomer in the gaseous phase
of the reaction vessel using the Peng-Robinson formula;
wherein when the number of monomer components in the target
10 polymer is represented as n (n is an integer of 2 or larger), the name of
each monomer component is represented as $A_1, A_2, \dots A_n$, the weight
percentage of each monomer component $A_1, A_2, \dots A_n$ of the target
polymer composition is represented as $a_1, a_2, \dots a_n$ (%) (a satisfies $\sum_n a_n =$
15 100), the weight percentage of each monomer component of the initial
monomer composition is represented as $a'_1, a'_2, \dots a'_n$ (%) (a' satisfies
 $\sum_n a'_n = 100$ and $a'_1, a'_2, \dots a'_n$ is determined in a constant manner
depending on predetermined polymerization conditions) and specific
gravity of the gaseous phase monomers when polymerizing/specific
20 gravity of the target polymer is represented as B, the composition weight
ratio of additional monomers is calculated for each monomer from the
formula

$$(a_1 - a'_1 \times B) : (a_2 - a'_2 \times B) \dots (a_n - a'_n \times B)$$

25 in the order of components $A_1, A_2, \dots A_n$, and additional monomers
containing additional monomers in the composition weight ratio of
additional monomers are added.

2. The process for preparing a fluorine-containing polymer of
Claim 1, wherein the polymerization pressure is at least 4 MPa.

3. The process for preparing a fluorine-containing polymer of
5 Claim 1 or 2, wherein said fluorine-containing polymer is a copolymer
comprising vinylidene fluoride and hexafluoropropylene; and
the mol ratio of vinylidene fluoride:hexafluoropropylene is 9:1 to 5:5.

4. The process for preparing a fluorine-containing polymer of
10 Claim 1, wherein the polymerization pressure is at least 3 MPa.

5. The process for preparing a fluorine-containing polymer of
Claim 4, wherein said fluorine-containing polymer is a copolymer
comprising vinylidene fluoride, hexafluoropropylene and
15 tetrafluoroethylene; and
the mol ratio of vinylidene fluoride:hexafluoropropylene is 9:1 to 5:5 and
the content of tetrafluoroethylene is at most 40 % by mol.

6. A fluorine-containing polymer composition comprising the
20 fluorine-containing polymer obtained by the process of Claim 1, a curing
agent and a vulcanization accelerator.

7. The fluorine-containing polymer composition of Claim 6,
wherein said fluorine-containing polymer has Mooney viscosity of at
25 most 15 at 121°C and essentially does not contain iodine and said
composition has compression set after vulcanization of at most 25 %.

8. The fluorine-containing polymer composition of Claim 6, wherein weight average molecular weight/number average molecular weight measured by GPC is at most 3.0.

5 9. A fluorine-containing polymer, which is a copolymer comprising vinylidene fluoride and hexafluoropropylene; wherein the mol ratio of vinylidene fluoride:hexafluoropropylene is 9:1 to 5:5, the content of tetrafluoroethylene is 0 to 40 % by mol, the weight average molecular weight is at most 140,000, weight average molecular
10 weight/number average molecular weight is at most 3.0, iodine is essentially not contained and the compression set after vulcanization is at most 30%.

10 10. A fluorine-containing polymer composition comprising the fluorine-containing polymer of Claim 9, a curing agent and a vulcanization accelerator.

11 11. A processing aid comprising the fluorine-containing polymer obtained by the process of Claim 1, which has Mooney viscosity of at most 15 at 121°C and essentially does not contain iodine.
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12. A processing aid comprising the fluorine-containing polymer of Claim 9.

25 13. A fluorine-containing polymer composition comprising the processing aid of Claim 11 and a fluorine-containing polymer having Mooney viscosity of at least 15 at 121°C.

14. A fluorine-containing polymer composition comprising the processing aid of Claim 12 and a fluorine-containing polymer having Mooney viscosity of at least 15 at 121°C.

5 15. A process for preparing vulcanized fluororubber, which comprises conducting primary vulcanization of the fluorine-containing polymer composition of Claim 10, while conducting defoaming treatment under reduced pressure.